



Integrated Computer System (ICS) for Ford Police Interceptor

OWNER'S MANUAL V1.1



Read these instructions carefully before using this product and keep this manual for future reference.

Integrated Computer System

Manual Revision	Description	Date
LX_ICS_OwnersManual_v1.0	Initial owner's manual release	April 23, 2020
LX_ICS_OwnersManual_v1.1	Updated part numbers	July 13, 2020

This owner's manual applies to the following part numbers:

Supported Vehicle	Ford Part Number	Description
Police Interceptor Utility (2020 -)	AMLB5J-10F884-BA (Factory Part #) LB5Z-10F884-B (Service Part #) Vehicle feature order code 47E	Integrated Computer System (Screen + 1 AVX)

NOTICE

The latest version of software for the ICS can be downloaded at:

<https://www.lectronixinc.com/products/support/ICS>

For technical support, please contact Lectronix Inc. at (888)423-1183.



CAUTION

Driving while distracted can result in loss of vehicle control. Lectronix strongly recommends that drivers use extreme caution when using any device that may take their focus off the road. The primary responsibility is the safe operation of the vehicle. Lectronix does not recommend the use of any hand operated device while driving. Lectronix encourages drivers to use voice-operated systems when possible and that you become aware of applicable state and local laws that may affect use of electronic devices while driving.

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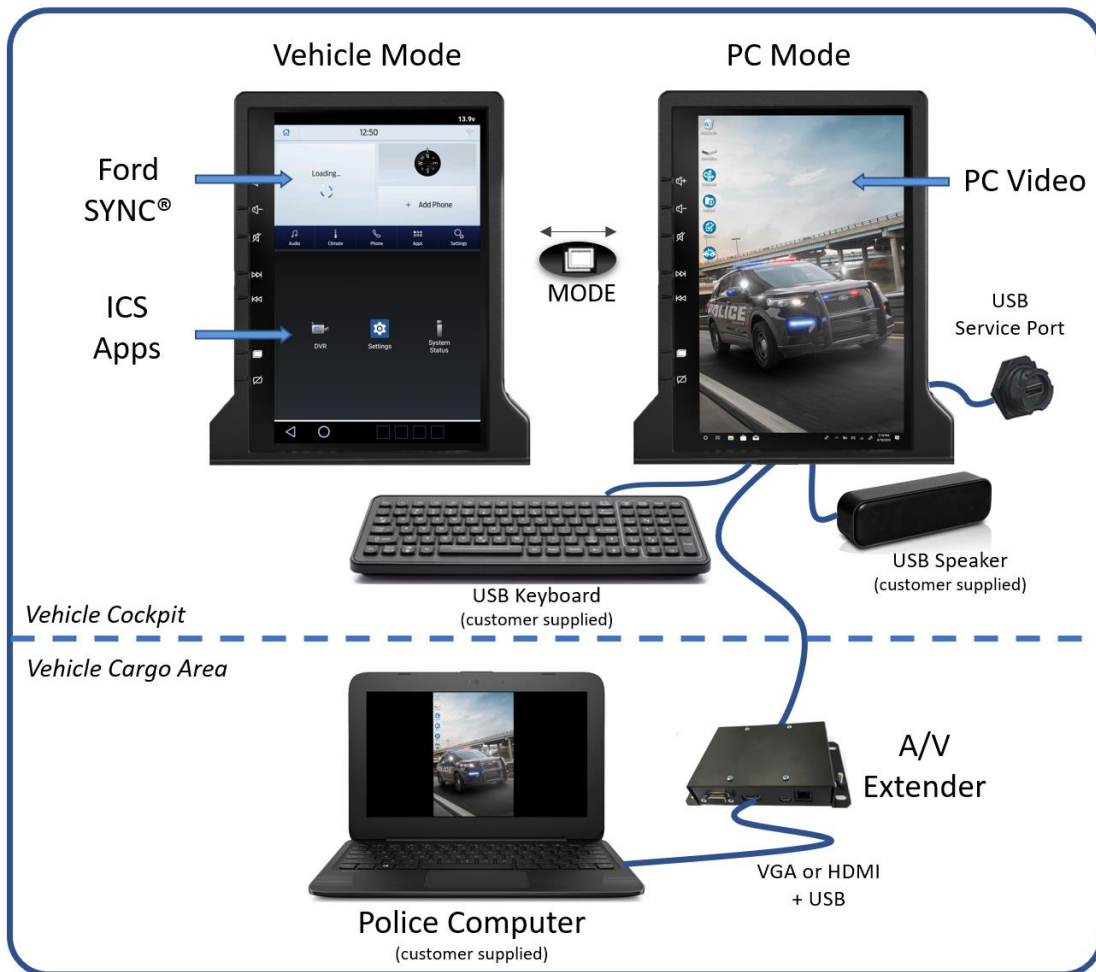
Overview

About the Integrated Computer System (ICS)

Thank you for purchasing the Integrated Computer System!

The ICS is a rugged in-dash touch screen designed specifically for police use and features two main operating modes:

- Vehicle Mode - includes Ford SYNC®, backup camera, and ICS applications
- PC Mode - provides a full-screen touch display for the customer's police computer



The ICS allows relocation of the police computer from the cockpit to the cargo area. The computer connects using standard HDMI/VGA and USB interfaces to an Audio/ Video Extender (AVX) which converges these standard interfaces into a single CAT6 cable that runs to the front of the vehicle and connects to the ICS screen.

The AVX is provided as part of the ICS system.

The customer provides the police computer, USB keyboard, and USB speaker to complete the vehicle setup.

Table of Contents

Audio Integration

Audio from the Ford SYNC® system is controlled on the ICS screen and played over the vehicle's speaker sound system. Audio from the attached police computer and any other ICS on-board applications is combined and played over the dedicated USB speaker.

Touch Screen Display Interface

The diagram below shows the basic layout of the touch screen display:



SYNC® Display: The upper portion of the screen is used for the Ford SYNC® display. Please refer to available Ford SYNC® documentation for further information.

SYNC® Controls: These buttons adjust audio levels and tuning for Ford SYNC®.

Screen Controls: The screen Mode touch button is used to toggle between Vehicle and PC display modes. The On/Off button toggles the screen on and off.

ICS Applications: The lower portion of the screen has ICS applications for additional integration, system setup, and monitoring of system status. At the very bottom of the screen are the Back and Home buttons for use with ICS applications. As applications are run, their icons appear in the App Shortcuts area for easy re-selection.

Integration with Vehicle

Screen Dimming

The ICS screen automatically adjusts brightness when the Instrument Lighting Dimmer switch is adjusted up and down. The SYNC® system can also be used to specifically adjust brightness of the screen. Please refer to the vehicle owner's manual for details of these controls.

Dark Car Feature

The Dark Car Feature (if equipped) provides a way to shut off all interior lighting in the vehicle when the Instrument Lighting Dimmer switch is adjusted to the lowest setting.

When Dark Car mode is activated, the ICS turns off the LCD display and backlit icons. It also disables power to the USB keyboard, to ensure key backlighting is turned off.

Screen Mode Switching

In general, the user is in control of switching the ICS screen between the two primary modes, Vehicle Mode and PC Mode. This switching is done either by touching the Mode switch on the screen or using the steering wheel control button (see page 10 for details on steering wheel assignment).

In addition to this manual selection, there are a couple special cases when the ICS will automatically switch between the display modes, as described below:

- If the user is in PC Mode, and the vehicle backup camera is activated (such as the vehicle is put into reverse) the ICS will automatically switch to the Vehicle display mode so that the activated camera is visible to the user (see page 10 for further details and optional disable of this feature).
- If the user is in PC Mode and the volume buttons on the left-hand side of the screen are adjusted, the ICS will automatically switch for 3 seconds to Vehicle Mode, so that the volume adjustment level shown in the SYNC® window is visible to the user.

Power Modes

The ICS automatically turns on and off with the vehicle in a way typical of automotive in-dash screens. The ICS turns on when the key is turned on. The ICS turns off when the key is turned off AND the driver-side door is opened.

When the ICS is turned off, it enters a low-power standby state for 48 hours. If the vehicle is turned on again during this period, the ICS comes up instantly from this standby state. After 48 hours of no usage, the ICS completely turns off, and the next startup will take longer to complete (around 20-30 seconds).

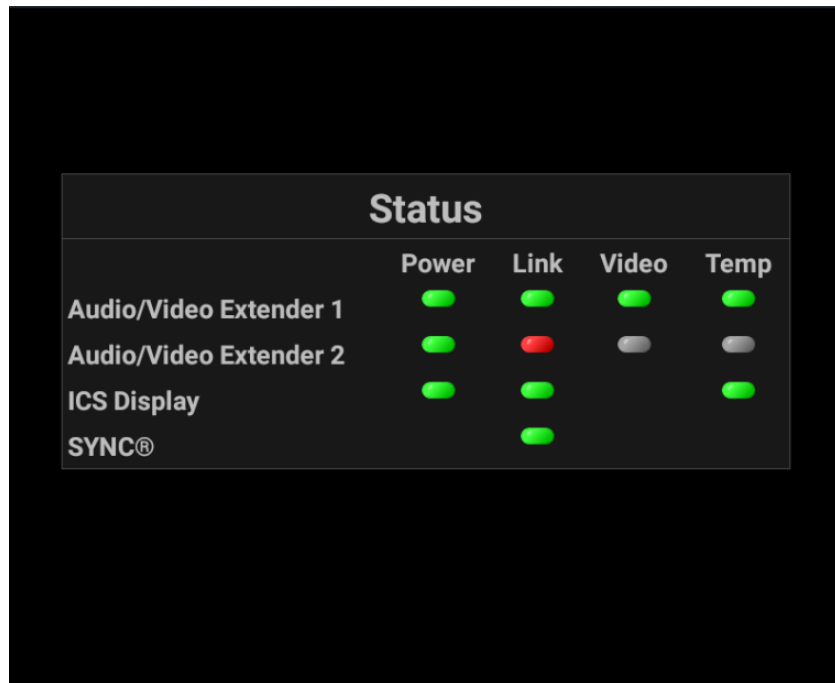
In any standby and operating state, the vehicle's 12V battery voltage is monitored and the ICS will shut down to avoid draining the battery if the voltage is too low.

Applications – System Status

Applications – System Status

The System Status application provides an “at-a-glance” report on the operational status of the system.

The diagram below shows the basic layout of the application:



Status	Description
Power	GREEN indicates the component has power. If RED , check cabling to the component.
Link	GREEN indicates the ICS processor is communicating with the component. Will be GREY if no power. RED may indicate a problem with the cabling to the device.
Video	GREEN indicates a valid video signal is being received over the link. Will be GREY if no Link or Power. If RED , check the video source being provided to the AVX is at a supported resolution (e.g. 800 x 1280 for AVX1), and the video cable between the source and the AVX.
Temp	GREEN indicates the temperature of the component is within a normal range. Will be GREY if no Link. If RED , please contact ICS technical support.

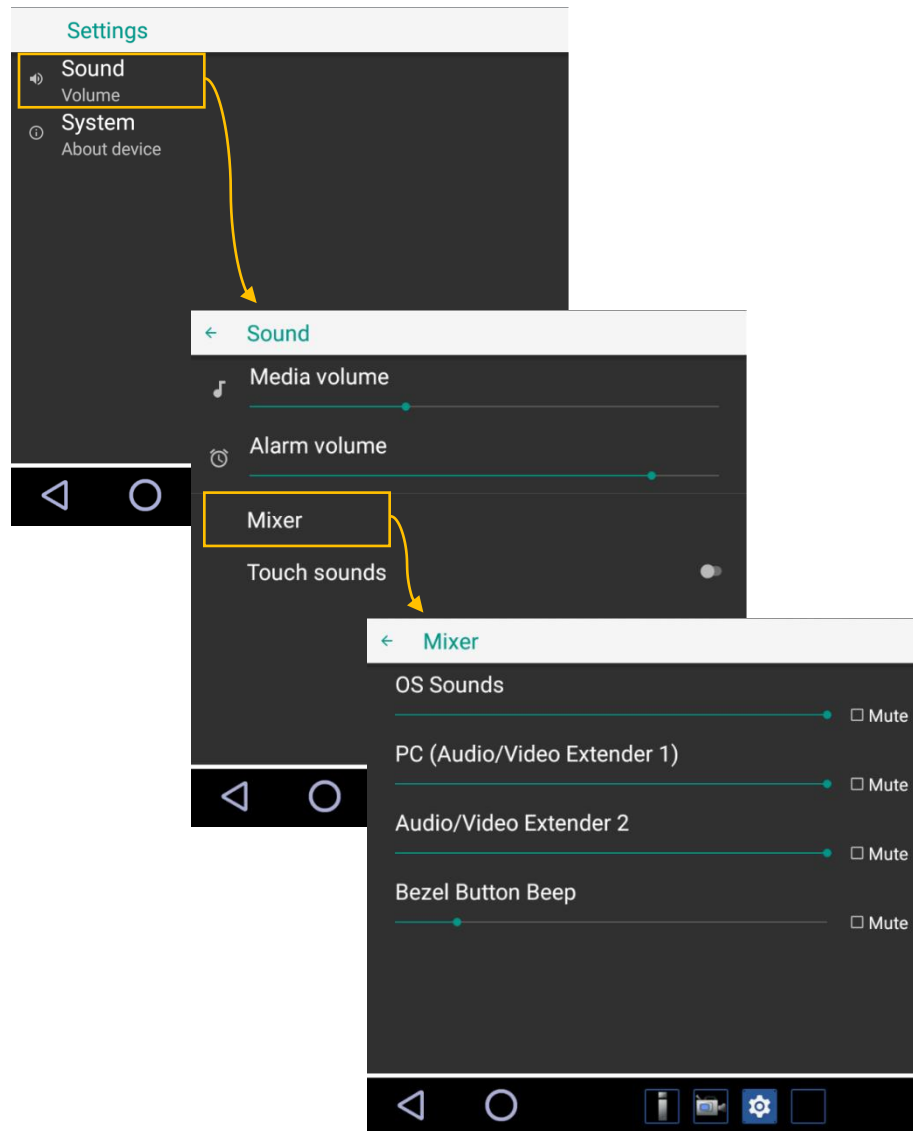
Note: AVX 1 is normally used with the attached police computer.

Note: AVX 2 (purchased separately) may be used for additional screen integrations such as the Digital Video Recorder (DVR) Viewing Window (see page 12).

Applications – System Setup

Sound settings

The Sound menu under the Settings application provides the setup options for ICS audio. These settings only impact the sound played out on the dedicated ICS USB speaker (customer supplied), not the vehicle speakers used by Ford SYNC®.



The “Media Volume” on the first menu applies overall to the full mix of audio sources listed in the “Mixer” menu. So overall volume can be adjusted, or the individual sources can be adjusted up or down. “Alarm Volume” is not currently used but is a standard feature of the ICS operating system and included for future purposes.

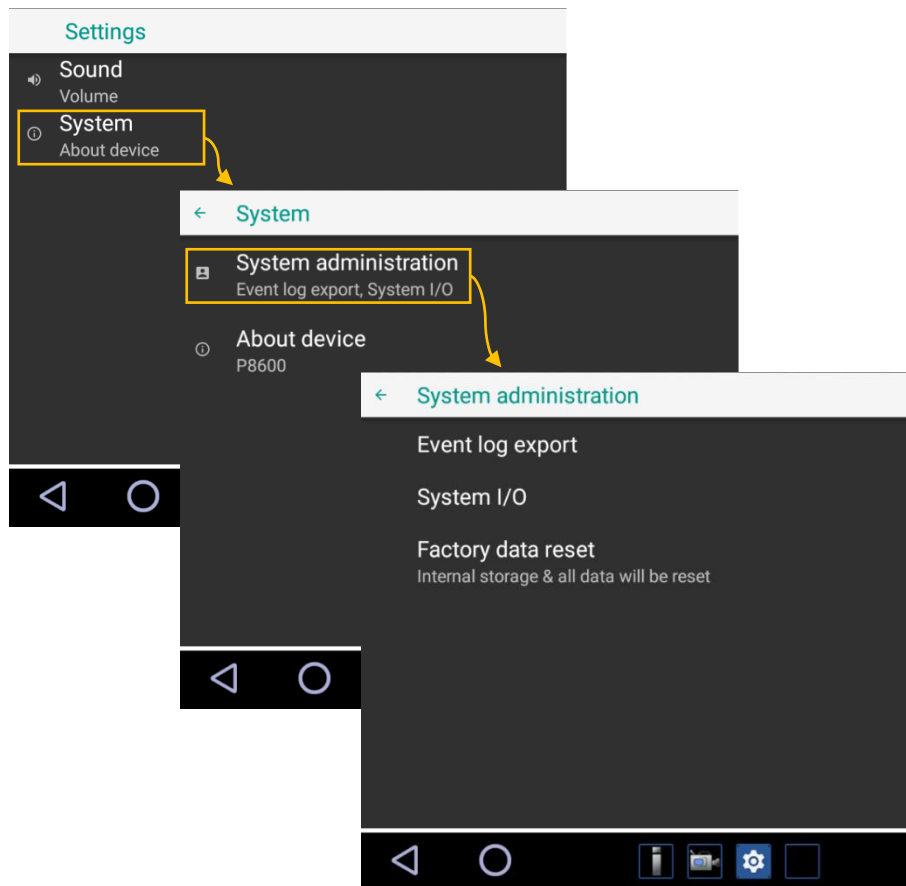
Applications – System Setup

System Administrator Functions

The system administrator settings for the ICS include the following options:

1. Event Log Export – used to obtain a log of diagnostic events which can be analyzed by the ICS support team to remotely troubleshoot issues
2. System I/O – settings related to hardware options and steering wheel control setup
3. Factory data reset – wipes the system clean of all settings and restores to factory default

The menu path to these three options is shown below:

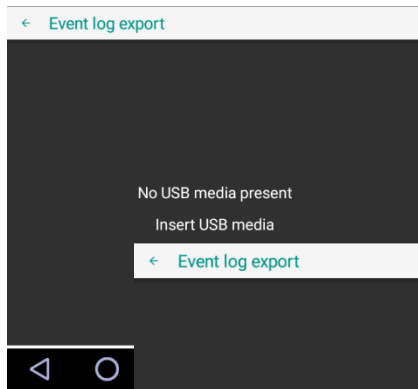


The following sections describe these system administrator functions in detail...

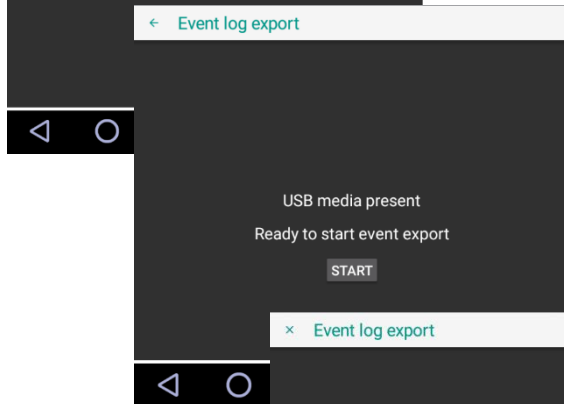
Applications – System Setup

System Administration - Event Log Export

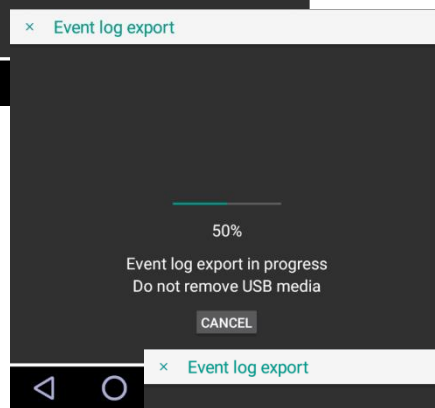
In the event of technical difficulties in the field, the ICS support team may request an event log export. This export process creates log files on a USB memory stick that can then be sent to the ICS support team for further analysis.



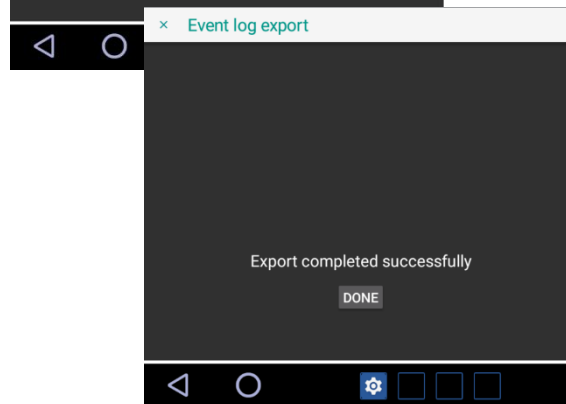
A USB memory stick is required for this step... insert into the Service USB Port...



Press start after the USB memory stick is recognized...



Wait as the system exports the log of diagnostic information...



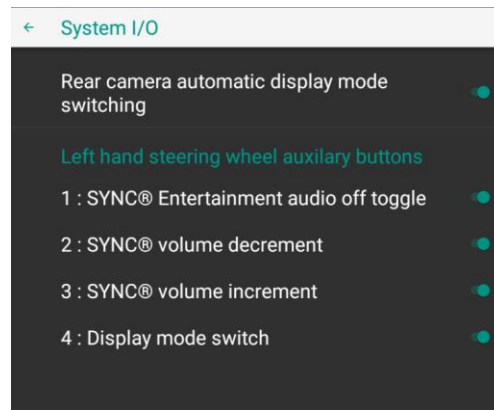
After the export completes, the USB stick can be removed, and the contents sent to ICS technical support for analysis...

After the export completes, the log files are stored in a folder on the USB media device named “\exports” in a subfolder named with the current date and time.

Applications – System Setup

System Administration – System I/O

The System I/O section of the setup application is used to configure hardware options related to the system. Use the sliders to turn on / off each feature. The menu options are shown below:



Rear camera automatic mode switching (PC to Vehicle)

ICS units are configured to automatically switch from PC Mode to Vehicle mode when a request for the rear camera is sent from the vehicle. The rear camera image will appear in the top window when in Vehicle Mode. There are various conditions when the rear camera is enabled, including when the vehicle is put into reverse, if the Police Perimeter Alert Option is activated, or if the Rear Camera On Demand option is activated.

The capability to disable the rear camera automatic display mode switching is specifically offered for units with the optional rear camera viewable in the rearview mirror. When disabled, the system will remain in PC Mode when the rear camera is activated.



CAUTION

The rear camera is an important safety feature and this option should not be disabled unless the rear camera viewable in the rearview mirror option is ordered on the unit.

Steering Wheel – 4 remappable latching switches

The 4 remappable latching switches on the left side of the steering wheel are configured on the ICS system for specific functions (See image below). If steering wheel control of these ICS functions is not desired, the buttons can be individually disabled in this menu.



Note: The Police Interceptor 4 remappable latching switches are mapped to discrete output signals (wires) that can be used for controlling other equipment in the police car (See up-fitters guide).

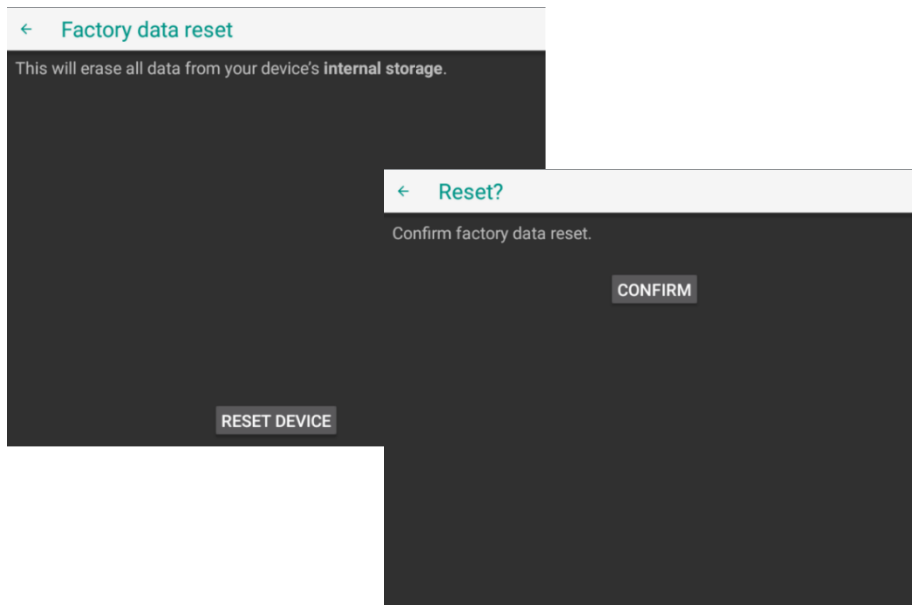
If these buttons are used to control other Police equipment, the ICS use of those specific buttons should be disabled.

Applications – System Setup

System Administration – Factory Data Reset

If the ICS begins acting in an unexpected way, a factory data reset can be tried to see if restoring default settings improves the behavior. This operation erases the internal storage that holds ICS settings.

The following screens show the steps in this operation:



After confirming the request for Factory Data Reset, the system will reboot twice before resuming normal operation with all settings cleared.

Applications – DVR Viewing Window

Applications – DVR Viewing Window

The Digital Video Recorder (DVR) application provides a viewing window for additional video input from police equipment in the vehicle. The application uses a second A/V Extender (purchased separately) to bring in audio and video and provide touch screen feedback to the customer's device. This is similar to the support offered for connected computers in full-screen PC mode, but with reduced resolution.

This application is illustrated below:



The user interacts with the connected equipment by touching within the viewing window. To the left of the viewing window is a MUTE button that provides a convenient way to enable and disable audio from the device.

To be supported by the DVR application, connected devices must be able to operate with 640 x 480 screen resolution. The connected device also should support standard USB mouse and audio profiles.

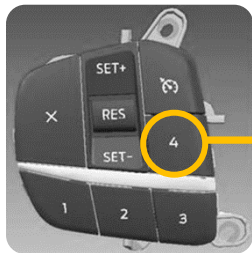
Additional AVX units for use with the DVR application can be obtained by your Ford dealer with Ford part number **LB5Z- 10F884-A**. This part order comes with the AVX unit and standard HDMI/USB cables for connecting to your device. The cable that connects the AVX to the ICS Display is already installed with the base system and is labeled "DVR".

Updating Software via USB

Updating Software via USB

Software updates are loaded onto the ICS via the Service USB port. Latest software versions are available from the Lectronix website at www.lectronixinc.com/products/support/ics. Obtain the software update and place it into the root directory of a USB stick. Insert the USB stick into the Service USB port.

To begin the software update process, press and hold the button on the left-hand side of the steering wheel labeled “4”. **Note: The vehicle should remain key-on for the duration of the update.**



... Press and hold steering wheel button “4” for **5 seconds** until the system displays “Shutting down” and then brings up the software update utility.

```
ICS Software Maintenance
Use USB keyboard arrow up/down or bezel volume up/down
to move highlight. Enter on keyboard or bezel Mute
to select.
```

```
Reboot system now
Apply update from USB
Wipe data/factory reset
Wipe cache
```

Select “Apply update from USB”.

```
ICS Software Maintenance
Use USB keyboard arrow up/down or bezel volume up/down
to move highlight. Enter on keyboard or bezel Mute
to select.
```

```
Choose a package to install:
/mnt/usb
```

```
../
ics_update-P4.1.0.zip
```

Select desired update file.

The software update utility will then display status messages as it moves through the update procedure which may take several minutes to complete. When the updater stops and displays “**Update from USB complete**”, select “**Reboot system now**” to restart with the new software.

After completing the software update, the new version can be confirmed by going to the Settings application “About Device” menu and confirming the expected version is reported.

Configuring a PC for use with the ICS

Configuring a PC for use with the ICS

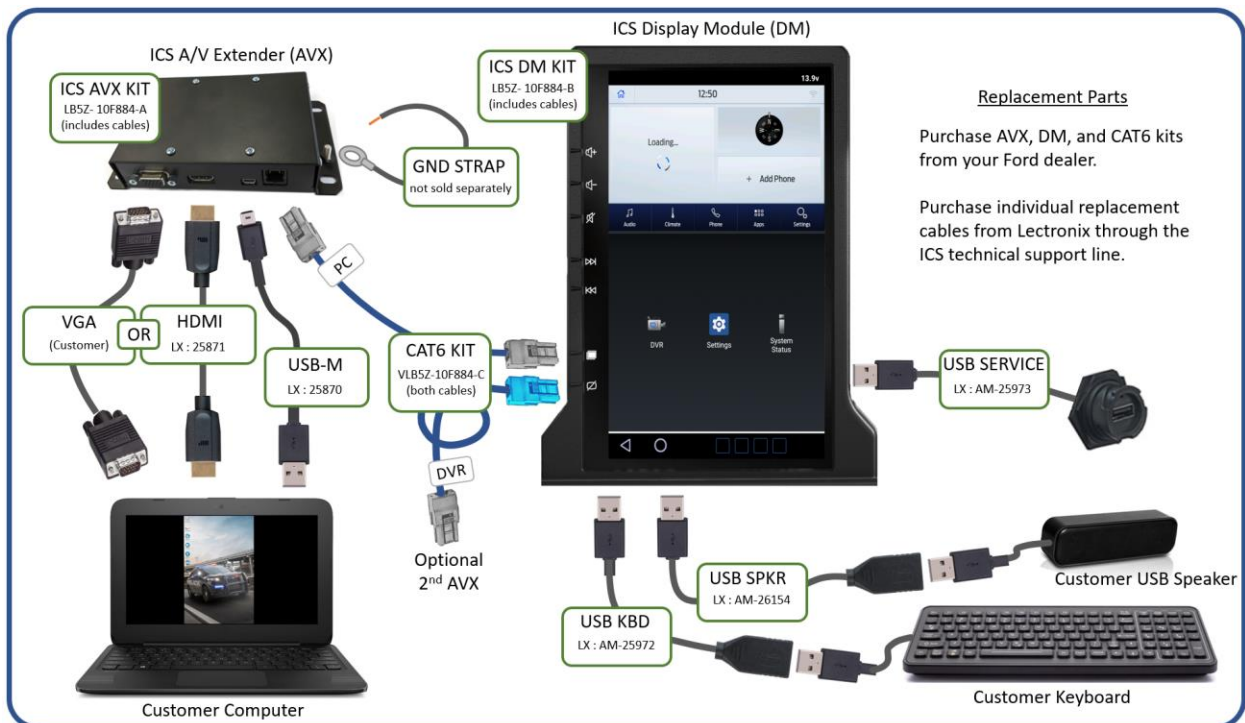
For optimal operation of the ICS it is important that the attached computer is configured properly. The configuration recommendations below are common on Windows 10 computers, though methods to access the settings may vary slightly on different PCs and Windows versions.

Configuration Setting	Recommendations
Display Resolution	800x1280 (Preferred) Alternatives: 1024x1280 or 1024x1600 The screen's native resolution is 800x1280 so this is the preferred setting. However, if your applications require a screen wider than 800 pixels, then the higher resolution modes help fit a bit more on the screen.
Display Orientation	Portrait The screen's orientation is "portrait mode" rather than "landscape mode". If the PC video is showing up sideways on the ICS screen, check this setting.
Display Multi-Monitor	Second Screen Only The ICS appears as a second screen to the attached laptop or tablet PC. Since the PC is typically stowed in the cargo area, it is desirable to turn off its screen and show the display only on the second screen only (ICS screen).
Display Text Size	150% (or to preference) Increasing the default Windows text size may help improve readability in a vehicle environment. Experiment with settings to determine the optimal selection for your applications.
Set Default Audio Device	ICS Digital Audio Select "ICS Digital Audio" as the default sound device so that audio is routed to the ICS.
PC Sleep Mode	Disabled (when "plugged in") Generally it is not desirable to have the PC ever go to sleep while used with the ICS. If the PC does go to sleep, the PC mode will show a black screen briefly and then revert back to the vehicle mode screen. Hitting a key or touching the screen during the brief black screen may wake the PC up. But it's generally better to avoid this and leave the PC always on when the vehicle is on.
USB Selective Suspend	Disabled Windows may be configured to suspend USB ports when not in use. This option should be disabled to ensure maximum responsiveness with the ICS.
Start PC when AC is Present	Enabled (BIOS setting) Many PCs designed for mobile use have a BIOS setting option to automatically startup the PC when power is applied. Enabling this option and installing a vehicle charger ensures the PC will turn on when the vehicle is turned on.

ICS Wiring and Installation

ICS Wiring and Installation

The illustration below shows the components and cables of the ICS system:

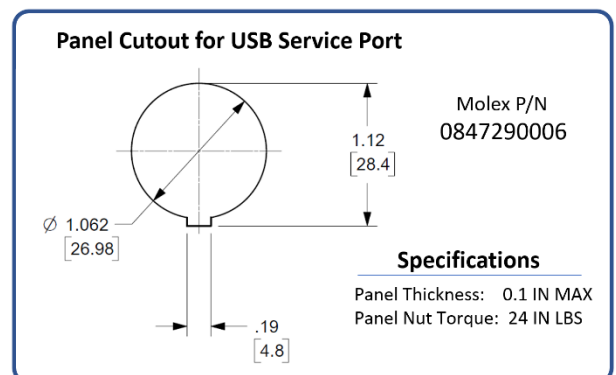


When the vehicle is delivered, the Display Module is already installed and any cables that connect to it are installed and left accessible to the customer to complete installation of equipment.

The basic installation steps related to the ICS that are left to the customer include:

1. Install the USB service port cable

- The USB service port USB cable is a weather sealed passthrough connector that is intended to be left accessible (covered with dust cap) for future software updates and system maintenance use.
- Identify a location for mounting the passthrough connector. This may vary by customer's preference and vehicle configuration, but it is expected to typically be in an out-of-the-way area of the police vehicle's center console.
- Cutout opening for the passthrough connector and install cable using panel nut.



2. Install a USB speaker (customer supplied)

- Obtain a USB speaker for use with the system that meets the following specifications:
 - Maximum USB power current draw = 1.0A
 - USB bus-powered 2.0 Audio device
- When the vehicle is delivered, USB cables for Keyboard and Speaker are coiled up on the floor by the passenger footwell. Locate the cable labeled “Speaker” and plug the USB speaker into that port.
- Confirm that audio is working. The touch icons on the left-hand side of the screen are enabled by default to make beep sounds when touched and are a convenient way to test.
- Determine a location for and mount the speaker in proximity to the front seat occupants.

3. Install a USB keyboard (customer supplied)

- The ICS will support most standard mobile USB keyboards
- When the vehicle is delivered, USB cables for Keyboard and Speaker are coiled up on the floor by the passenger footwell. Locate the cable labeled “KBD” and plug the USB keyboard into that port.
- Finish installing the keyboard with preferred mounting in the cockpit area.

4. Install the AVX and attached computer

- The AVX unit should be mounted near the computer being used with the ICS, typically in the cargo area of the vehicle. Determine a location that works optimally with other equipment being installed and plan cable routing from the front to the AVX.
- Two CAT6 AVX cables are coiled on the floor by the passenger footwell when the vehicle is delivered. These cables are labeled PC and DVR. During vehicle upfitting for police equipment, these cables should be run back to the rear cargo area. The PC cable is used for the AVX that supports an attached computer and is displayed in PC Mode on the screen. The DVR cable is used for an optional second AVX and is displayed in the DVR application on the ICS.



CAUTION

CAT6 cables have precision inner constructions that can be damaged. Do not crush or bend in a radius of less than 2 inches.

- On the enclosure of the AVX there is a ground lug and a supplied ground strap. This ground strap must be tied to vehicle ground when the AVX is installed.
- Connect the AVX1 cable to the AVX and mount the AVX unit in its preferred location.
- Connect HDMI and USB cables from the AVX to the computer device (laptop, tablet, dock, brick PC, etc). NOTE: Since standard computer devices do not use robust automotive latching connectors, use tie downs and other best practices to ensure the cables are strain relieved and stay in place.
- Follow the instructions on page 14 for setting up the PC.

5. Install a 2nd AVX for the DVR application (ordered separately if needed)

- Refer to page 12 for further information about the DVR application

NOTE: DO NOT INSTALL ANY HAND-HELD COMMUNICATION DEVICE ON OR DIRECTLY NEXT TO SCREEN

Component Specifications

Component Specifications

ICS Display Module



12.1" ultra-durable display with Projected Capacitive Multi-Touch Screen using chemically strengthened glass

Resolution	800 x 1280, 1024 x 1280, 1024 x 1600
Brightness	1200 NIT daylight readable
Viewing Angle	88° from all angles
Environmental	-20°C to +70°C (-4°F to +158°F) Note: Below -20°C an internal heating element activates to bring display up to operating temperature.
Service Part Number	LB5Z-10F884-B (kit with USB cables)

Audio Video Extender



Audio and Video adapter - converts standard PC interfaces into high-speed digital bus on a CAT6 cable

Video Inputs	HDMI and VGA
USB Profiles supported to attached PC	USB Standard Profiles <ul style="list-style-type: none"> - Keyboard - Pointing Device - Audio Sound Device
Environmental	-40°C to +85°C (-40°F to +185°F)
Service Part Number	LB5Z-10F884-A (kit with USB and HDMI cables)

CAT6 Cable Kit



Replacement CAT6 Cables (Set of 2 for PC + DVR)

Service Part Number	VLB5Z-10F884-C
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Troubleshooting

Issue	Potential Cause	Potential Solution
When I turn on the vehicle my ICS screen stays dark	The screen may be too cold to turn on	The ICS has a heater element attached to the display which will warm it to valid operating conditions (above -20°C) within 2 minutes. In this condition the ICS announces “Display warming up” over the speaker.
When I try to switch modes to PC Mode, the screen reverts back to the vehicle mode and displays “no PC video found”	The PC is not turning on	Set PC to wake automatically when the vehicle starts (BIOS setting to automatically turn on when plugged in).
	The AVX is not responding	Check the Status app’s LINK status for AVX1. If the LINK is green but VIDEO is red, then the AVX connection is OK, but the PC video is not.
	Cabling is disconnected to the PC	If the LINK status is GREEN but the VIDEO status is RED, confirm that the PC is turned on and cabling is good to the AVX.
	The PC is going to sleep	Try to hit a key in the brief interval before PC Mode times out and reverts to the Vehicle Mode screen. Setup the PC to not enter sleep mode ever while “plugged in”.
I do not hear any audio from my attached PC	No USB speaker	You must install a USB speaker to hear audio from the remote PC.
	PC volume is turned down on the PC	Confirm the volume setting on the PC.
	PC does not see ICS sound device	Confirm that the PC recognizes a USB device named “ICS Audio” while connected to the ICS.
	PC is not sending audio to the ICS	Confirm that “ICS Audio Device” is selected as the default audio device in Windows setup.
	Mixer volume is set too low for PC audio	Check settings in the Setup application for the mixer.
My software application does not fit on the screen	Change resolution to 1024 bits wide	Different Windows applications may have different requirements for horizontal screen width (in pixels). If your application does not fit, you can try changing to 1024 pixels wide.

Warranty Statement

Warranty Statement



ICS by Lectronix

Integrated Computer System for Public Safety Vehicles

LIMITED WARRANTY

All Ford part numbers provided by Lectronix, Inc. are warranted to be free from defects in materials or workmanship on products properly installed per the installation instructions provided with the product. This warranty covers repair or replacement of any defective product at no charge during the applicable warranty period listed below. Labor for replacement or service of defective product is not paid or reimbursed by Lectronix, Inc.

WARRANTY PERIOD		
	USA	Outside USA
Product which appears on New Vehicle Monroney Label (window sticker)	Coverage which matches new vehicle warranty---Ford - 3 years or 36,000 miles whichever comes first; Lincoln 4 years or 50,000 miles whichever comes first	Coverage which matches new vehicle warranty ---Ford - 3 years or 60,000 kilometers whichever comes first; Lincoln 4 years or 80,000 km whichever comes first
Part purchased and installed during or after the original vehicle warranty	Whichever of the following options which provides the greater benefit to the customer: 1) 2 years / unlimited miles or 2) The remainder of the new vehicle warranty	Whichever of the following options which provides the greater benefit to the customer: 1) 2 years / unlimited kilometers or 2) The remainder of the new vehicle warranty

This limited warranty does not cover any damage, defect or malfunction caused by misuse, abuse, accident, improper installation, modification or improper or lack of maintenance. Incidental and consequential damages are not recoverable under this warranty. This warranty offers you specific legal rights. You may have additional or other rights as which vary from state to state or province to province.

If you experience a warranty issue with this product please visit your Ford dealer. If the repair is covered by the warranty above and completed by the dealership, labor is also covered by Ford -- Ford Warranty and Policy – Section 3.

Please note that Lectronix has replacement component parts available to assist consumers and dealers to resolve warranty and non-warranty issues as quickly as possible.

Note to dealer:

Ford dealers should contact Lectronix, Inc. by phone at (888)423-1183 and ask to speak to the warranty administrator or by email to: icsrma@lectronixinc.com.

Technical Support

For the latest version of the owner's manual, software updates, and other documentation, please visit:

www.lectronixinc.com/products/support/ics



To speak with the ICS technical support team, call us at:

Tech Support Hotline

(888)423-1183

Monday - Friday

8:30 AM - 5:00 PM EST